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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,535	08/28/2003	David C. Yates	IND 053 DIV1/GSG	9035

27777 7590 10/17/2005

PHILIP S. JOHNSON
JOHNSON & JOHNSON
ONE JOHNSON & JOHNSON PLAZA
NEW BRUNSWICK, NJ 08933-7003

EXAMINER	
JAGAN, MIRELLYS	

ART UNIT	PAPER NUMBER
2859	

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/650,535	YATES ET AL.	
	Examiner	Art Unit	
	Mirellys Jagan	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *22-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *22,23,25-30 and 32-36* is/are rejected.

7)☒ Claim(s) *24 and 31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/28/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 22-36 are objected to because of the following informalities:

In claims 22 and 30, it is not clear from where the optical stimulus and the optical response are generated and received from, e.g., is the optical stimulus generated by the laser diode to the optic fiber tip, and is the optical response received from the optic fiber tip?

Claims 23-29 and 31-36 are objected to for being dependent on an objected base claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 22 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,473,428 to Lee et al [hereinafter Lee].

Referring to claim 22, Lee discloses a method of maintaining the temperature of an optical fiber tip (68) of a laser system at a desired (preselected) temperature by:

processing an optical stimulus and an optical response to determine a temperature of the tip as a function thereof;

comparing the determined temperature to the preselected temperature;

generating a signal that is a function of a difference between the determined and the desired threshold temperature (i.e., determining an 'error' signal); and

controlling power output to a laser diode (22) of the laser system based on the generated signal (see figure 1; column 4, lines 1-58; column 6, lines 56-61; column 7, lines 25-30; and column 9, lines 30-39).

Referring to claim 30, Lee discloses a system including a laser diode (22) for providing a laser beam to an optical fiber tip, the system comprising:

a processor (40) for determining a temperature by processing an optical stimulus and an optical response;

a power amplifier for supplying power to the diode; and

a controller (46) for providing a power output signal (204) to the amplifier, and containing an algorithm for calculating the power signal as a function of a signal generated by comparing the determined temperature and a desired temperature (i.e., determining an error).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 22, 23, 25, 30, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,695,697 to Kosa in view of U.S. Patent 5,222,810 to Kleinerman.

Referring to claims 22, 23, and 25, Kosa discloses a method of maintaining the temperature of an optical fiber tip of a laser system at a desired temperature by:

processing an optical stimulus and an optical response to determine a temperature of the tip as a function thereof;

comparing the determined temperature to the preselected temperature;

generating a signal that is a function of a difference between the determined and the desired threshold temperature (i.e., determining an 'error' signal);

controlling power output to a laser (YAG-type) of the laser system based on the generated signal; and

determining whether the determined temperature is within a defined control band for the desired temperature having an upper and lower limit, i.e., temperature range;

wherein a minimum power output is provided (power is terminated) to the laser when the determined temperature is greater than or less than the upper and lower limits, respectively; and the controller can control the determined temperature so that it is within the upper and lower limits (see figure 1; column 1, lines 6-67; column 2, lines 42-68; column 5, line 48-60; column 6, lines 35-44; column 8, lines 17-27; column 9, lines 64-column 10, line 3; column 11, lines 20-41; and column 12, lines 46-66).

Referring to claims 30 and 32, Kosa discloses a system including a laser for providing a laser beam to an optical fiber tip, the system comprising:

a processor for determining a temperature by processing an optical stimulus and an optical response;

a power amplifier (13) for supplying power to the laser; and

a controller for providing a power output signal to the amplifier, and containing an algorithm for calculating the power signal as a function of a signal generated by comparing the determined temperature and a desired temperature (i.e., determining an error); wherein the controller provides a minimum power output (power is terminated) to the laser when the determined temperature is greater than or less than the upper and lower limits, respectively; and the controller can control the determined temperature so that it is within the upper and lower limits.

Kosa does not disclose that the laser is a laser diode.

Kleinerman discloses a system including a laser diode (22) for providing a laser beam to an optical fiber tip for determining a temperature of the tip by processing an optical stimulus and an optical response. Kleinerman teaches that laser diodes are inexpensive and commercially available alternative to YAG-type lasers used in the art (see column 16, lines 19-28).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system disclosed by Kosa by replacing the laser with a laser diode, since Kleinerman discloses laser diodes are a less inexpensive and commercially available alternative to lasers as used by Kosa.

6. Claims 26-29 and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosa in view of the publication "Principles And Practice Of Automatic Process Control" by Smith et al [hereinafter Smith].

Kosa discloses a method and system having all of the limitations of claims 26-29 and 33-36, as stated above in paragraph 5, except for the controller being a P-I controller having a

proportional component being the product of the difference, i.e., error, signal and a proportional scaling factor, and an integrator component being the product of an integrator scaling factor and the error signals over time; and the integrator component only being used upon the determined temperature transitioning into the control band so that power output remains continuous during transition..

Smith discloses that it is known to use P-I controllers in control loops, such as feedback loops, and that P-I controllers have a proportional component being the product of an error signal and a proportional scaling factor (K_c), and an integrator component being the product of an integrator scaling factor (K_c/τ_I) and error signals over time, wherein the error is the difference between a controlled variable and the desired set point for the controlled variable, e.g., an error is a difference between a measured temperature and a desired set-point temperature. In a feedback control loop, a P-I controller provides feedback control of the controlled variable by adjusting a process device (manipulated variable) based on a determined error in order to maintain the controlled variable at the set-point (eliminate the error), e.g., a P-I controller will adjust a thermal device to heat or cool the process when an error is determined between the measured temperature and the desired set-point temperature in order to maintain the measured temperature at the set point (eliminate the error). P-I controllers are desirable since they provide automatic control of a controlled process variable while removing an offset. Furthermore, Smith teaches that it is desirable that the integrator component not be used upon the measured temperature transitioning back into desired set-point temperature in order to prevent reset windup (see pages 1-9, 222-223, 225-227, 231-234, and 241-243).

Referring to claims 26 and 33, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system disclosed by Kosa by replacing the controller with a P-I controller, since Smith discloses that P-I controllers are a basic component of feedback control loops known in the art of automatic process control, and are useful for providing automatic control of a controlled process variable, such as temperature, while removing an offset.

Referring to claims 29 and 36, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system disclosed by Kosa and Smith by not having the integrator component being used upon the determined temperature transitioning into the control band in order to prevent reset windup, as taught by Smith.

Allowable Subject Matter

7. Claims 24 and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and amended to overcome the objections set forth in this Office action.

8. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not disclose or suggest the following in combination with the remaining limitations of the claims.

A method of maintaining temperature of an optical fiber tip in a laser system at a desired temperature, the method comprising providing maximum power output to the laser diode when the determined temperature is less than the lower limit for the control band (see claim 24).

A system for maintaining temperature of an optical fiber tip in a laser system at a desired temperature, the system comprising a controller that a power output signal so that a maximum power is supplied to the laser diode when the determined temperature is less than a lower limit of a defined control band for the desired temperature (see claim 31).

Response to Arguments

9. Applicant's arguments with respect to claims 22-36 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents disclose fiber optic thermal sensors:

U.S. Patent 5,351,268 to Jensen et al
U.S. Patent 5,473,428 to Lee et al
U.S. Patent 5,211,480 to Thomas et al
U.S. Patent 4,845,647 to Dils et al
U.S. Patent 4,895,156 to Schulze

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mirellys Jagan whose telephone number is 571-272-2247. The examiner can normally be reached on Monday-Friday from 11AM to 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJ
October 12, 2005

Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800